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Technology innovation & green policy in Korea

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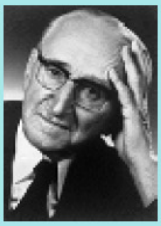
Discourses in Social Market Economy







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Abstract

The new growth engine in the 21st century depends on an innovative system to create, distribute and apply knowledge to industrialization processes. The industrial technology has been developed rapidly with the progress of knowledge based information in the last decade. In this point of view a cooperative partnership between industry and academy becomes much more important and necessary. Strategically fostering such cooperations and promoting rapid technology development have been reached with industrial clusterization in the last 20 years in Korea.

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During and after the Korean economic crisis in 1998 the so called 5 T's (information technology, biotechnology, nanotechnology, environmental technology and culture technology) had been strategically planned as growth engines for the further development in the 21th century. At the same time in the research institutes and universities in these fields research and development has been strongly supported. The research results have been stimulated to be transferred for the industrialization process. Industries can spare their own efforts and investment for the research and development by technology transfer process from the academy.

In Korea the original industrial clusters in some provinces were founded after 1960's and the rapid economic development could have been reached. For the further economic success the knowledge based technology and application in the industry the clusterization projects have been performed with academic research institutes and universities since 1990's. In the last government's era under the name of 'Balanced national development policy' the regional clusterization with academic education programs and research institutes strategically have been progressed.

For the stimulation of the industrial development there have been several cluster strategies performed. For example, for the regional industry development 'innovation clusters' have been planned and founded. The technoparks with traditional manufactories have been changed slowly and nowadays there are many companies with knowledge based items. For the essential infrastructures and logistics have been invested continuously. Large companies with associated SMEs (small and medium size enterprises) get together in the same cluster. R&D centers and universities support industries for the technology innovation and brain gaining. A joint development of a core technology can be promoted with a consortium between industry and academy. Many kinds of incentives are offered and regulations for the companies have been simplified. Not only the foreign investors, but also the domestic companies have moved into the regional clusters. The industrial clusters in the provinces could have been successful and devoted for the economic development in Korea.

1. Networking and Clustering

In an innovation cluster networking is one of the most important factor. Networking in a location, between locations, between local members and between companies is fruitful only with interacting and concentrated functions. A networking does not mean that there is no competition between companies or regions. With an effective networking system an innovative competitiveness with other regions can be reached.

A precluster with only a few small companies can be found at first for the further clusterization. These companies are linked together only with limited possibilities and it has also only little economic impact each other. But between these companies so called an anchor-companies can be born in the region. As a next step the clusterization will be processed with growing anchor companies.

In an emerging cluster, where the companies are linked together and they will organize an industry association. With such a process the cluster expands with growing linkage. Economic effects and networking will be stimulated. As time goes, the companies and cluster change after the market conditions. In this moment cluster and companies are flexible for restructuring and try to adapt themselves.

In the industry cluster a science park with research institutes and universities is very useful. In the science park knowledge networking can be practiced. A knowledge network should be organized with a purpose for cooperating researches, exchanging information and experiences. Especially networking between different levels and stakeholders within a science park is important. In a networked society the science and business community will be built. And naturally an environment for knowledge-sharing and networking will be realized. There can also be created a market for the business of technology transfer. Patents can be transferred between companies and research institutes. Industry cluster and science park can be used to network and globalize information across nations and over the nations.

2. Innovation System & Green Cluster

A cluster with innovation systems can be called as an innovation cluster. For networking and interacting in a cluster there needs professionals for the specific activities and functions to work with plan and concrete purposes. Even in digital economic system it is always useful to have experts for concentrating and interacting

in and surrounding regions. A specialist for networking creates processes to transfer knowledge in the cluster, between clusters and open innovation system. It is important for competitiveness with other companies and clusters. During the process the human resources and capitals are networked. The talent is a key intermediate in high technology industries and it will stimulate regional income and also regional growth.

The networks of interdependent companies and research institutions will be liked together and the value will be higher. Especially there can be established a valuable cooperative partnership between large company ans SMEs. A large company needs many kinds of partners in small- and medium size at a short distance. It motivated to build a sub minicluster centering around large company. This type of sub minicluster can be begun with business agreement and for a small company a professional supporting system will be found and continued during all the production process in the large company.

Besides innovation system a proenvironmental clusterization is necessary in the future. It is called as green cluster with ecosystem. A green cluster is based on the idea of industrial ecology, applied with natural ecological system. Concretely a purpose for zero emission and the wastes and by products are recycled. The percentage of renewable energy consumption is increasing and the economic performance will be also improved. There is a future perspective to form a green cluster with innovation system.

3. New Growth Engines

During and after the first economic crisis in Korea between 1997 and 2000 the so called 5 T's(biotechnology, nanotechnology, environmental technology, culture technology) had been strategically fostered as growth engines for the nation. At the same time for the industrial development research and development has been stimulated. Many venture companies with variable own technologies were born with supports by the government. There were many successful cases and also failed companies. At last Korea could reach economic development in comparison with other countries faster and the Korean economy has been stronger than before the economic crisis.

4. Technology & Green Policy

The 21st Century began with ubiquitous technology and it belongs to the ubiquitous society, in which IT is incorporated into everything around human life. Especially the ubiquitous technology is globalized and formed in convergence technology. In this era the ubiquitous, globalized and convergence technology play important roles. Information and communication technology have been advanced very rapidly in the last 20 years. Eniac was found in 1946 and it was the first digital computer in the history. Since then the hardware has been developed faster, smaller and become mobile. The software has been reliable, flexible und user-friendlier. And embedded technology, which is essential for the convergence technology was found.

Computers are bound with communication networks, for example client server system, distributed system and internet at last. Multimedea an internet has been spread very widely. The number of the user has been grown very rapidly and its globalization process accelerated. And the computer is used in every field, not only for business consumer, but also technical computing. The IT- industry in Korea has become very strong in the last years, especially semiconductors and cellular phones. The development of information technology industry could do for the paradigm shifts to policy, economy, education, social affairs, cultures, medicine and defences etc. The information technology based on convergence technology has become the key issue recently since the decleration of green growth paradigms.

The research and development strategy for the emerging environmental technology has developed with variable steps. On the 15th of August in 2008 the Korean president Lee, Myung Bak declared a new vision for the nation 'Low Carbon Green Growth'. The emerging green technology is based on the traditional green technology, for example, new and renewable energy resources. At second, the intelligent electric power with high efficiency and energy management for transportation and building. In third place the treatment of all the kind of waste and air pollution control are important subjects for environmental policy. The convergence green technology is based on the information technology, biotechnology, culture technology, nanotechnology and environmental technology. With these technologies it will be possible to overcome limitations of the existing technologies and create new areas in technology.

The level of environmental technology of Korea can be evaluated as 50-70% of the level of the advanced countries. The major green energy has a proportion of 1.4% in the world market and between 15 major countries Korea has the 11th green competitiveness. In 2007, 600 million US dollar was invested. The level of the environmental technology of Korea is anticipated to being 80% in 2012, 90% in 2020 compared with the green technology of advanced countries, respectively. Over 160,000 jobs will be created in 2012. The green technology will occupy over 7% of world market company in 2012, over 10% in 2020, respectively. The environmental sustainability index will be 20th in 2012, 10th in 2020, respectively.

How is the green policy being established for the national growth? There is a presidential committee for the green growth, which can be a umbrella function for the science and technology council, local governments, industry-, finance-, and green life council. The purpose of the presidential committee is to harmonize for the development of every social sector environmentally friendly. Because of the centralization and concentration of the organization there can be some or much problems and it will be necessary to be controlled.

The green policy is established with variable working parts. At first for the R&D the green convergence technology with green house gas reduction intensively fostered. And the commercialization of the green technology transfer will be accompanied by tax benefit and financial supports. For the globalization of the green technology international cooperation for research and business many ideas and strategies are planned and realized. Of course in every step the government expects many kinds of jobs to be created. For the higher efficiency of the investment there is a system for selection and concentration.

The 27 Major technologies consist of over 50 R&D projects and in 2008 the total investment was approximately 85 billion, for 2009 1.2 billion US dollar, respectively. In 2010 new and renewable energy resources, nuclear energy, intelligent transportation system, smart grid, ocean environment and advanced contents using convergence technology is now emphasized and the budget for the next year is now under consideration.

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